

Backwards and Boring: Phonics Instruction Has Got to Change!

Hours are spent doing ineffective drills. Children are bored. Teachers are frustrated with restrictive lengthy lessons. School systems are foregoing federal funding to avoid using “research-based” curricula. What’s the problem and what’s the solution?

It has been established by many studies that phoneme awareness (the ability to identify the individual sounds in words) and phonics (the ability to represent those sounds with letters) are essential for skilled reading (Ehri, 2004, Adams, 1994). But educators still have widely different views about *how this learning process should take place*. In an effort to insert phonics back into the daily curriculum for early readers, publishers have created curricula that contain drill-and-practice worksheets, and lessons that introduce phonics in a tedious way. Phonics instruction does not have to be boring and tedious. It can be joyful and meaningful. But the instruction has got to change.

Louisa Moats, Ph.D. in American Educator, 1998, put her finger on a critical problem. “One of the most fundamental flaws found in almost all phonics programs, including traditional ones, is that they teach the code backwards. That is, they go from letter to sound instead of from sound to letter. ...The print-to-sound (conventional phonics) approach leaves gaps, invites confusion, and creates inefficiencies.” Her article described in detail how systematic speech-to-print phonics instruction can be delivered. If these profound observations had been taken to heart, phonics instruction would have changed radically by now.

Perhaps in 1998 there was not enough convincing evidence to make such a turn-about occur, but recent research by neuroscientists and cognitive scientists has provided ample data to support this approach. These studies point to the fact that the foundation of reading is speech and that the organization of new reading skills in the brain must be built on this foundation.

Phonemes are not sounds processed uniquely by the auditory system; they are *articulated* sounds. It is the powerful motor system of speech that sequences and remembers phonemes. (How do you remember a phone number until you can write it down? You say it to yourself). Letters represent *articulated* sounds. Text is a way of making speech visible. The process of learning to read should start by turning spoken words into visible words.

The work of Linnea Ehri, Ph.D., provides a new understanding of how skilled readers can look at thousands of words and instantly recognize their meaning—(an unfamiliar experience for an alarming number of youngsters who struggle to read). How do skilled readers do it? According to Ehri’s research, the sight of a word triggers its *pronunciation*, and it is this *pronunciation* that has been stored in memory for convenient access along with the meaning of the word. Our lips may not be moving when we read, but our brains are “talking”

Ehri’s studies show that trying to recognize thousands of words from their visual appearance alone (pattern recognition) is almost impossible. It is the “speech memory” that is the key. She says, “Based on our findings, we have proposed

that pronunciations of words are the anchors for written words in memory. Readers learn sight words by making connections between letters seen in spellings of words and sounds detected in the pronunciations already present in memory.” (Ehri, 2002)

Recent brain research provides converging evidence. For a young child, reading is a very complex process to master. The brain’s amazing system of nerve cells and fibers has to figure out how to organize this new information—where to store the different elements of reading, and how to connect them instantly. The first experiences with letters and words will dictate how the brain establishes neural networks that may become habitual pathways as reading skills develop.

Dr. Sally Shaywitz, at Yale University, and others have determined with fMRI technology that these networks are composed of three essential elements of reading—the *pronunciation* of the word, the *meaning* of the word and the *visual appearance* of the word. In good readers these elements are typically stored in the *left* hemisphere, connecting the new visual experience to areas already devoted to speech and comprehension. Other studies (Simos et al, 2002, Aylward et al, 2003) have shown that dyslexics tend to activate *right* hemisphere areas, at some neural distance from where speech and comprehension reside in the left hemisphere. However, when these dyslexics are given an intense period of phonemically based intervention, this activation tends to move to the left hemisphere resulting in a pattern of activation resembling that produced by good readers.

This remarkable work suggests that early instruction in reading can profoundly effect how the brain chooses to organize this critical new skill.

There are two ways to provide systematic instruction in phonemic awareness and phonics: (1) DECODING INSTRUCTION (reading words) and (2) ENCODING INSTRUCTION (constructing words).

With DECODING INSTRUCTION (print-to-speech):

- *Visual* processing is activated first, relying on analysis and recognition of patterns, contours, shapes, configurations (typically right hemisphere processes).
- Pronunciation and meaning are only achieved after successful *visual* analysis.
- Retrieval of knowledge about the alphabet code involves *letter-to-sound* associations. This process involves visually *de-constructing* a word that has already been written by someone else, frequently words that use more advanced rules of spelling or are “outlaw” words. It can be confusing to encounter exceptions when a child is trying to learn how the alphabetic principle works.
- Many instructional activities tend to be divorced from meaningful experience with text, including exercises that involve *visual* analysis of lists of unrelated words or sentences, such as counting phonemes, underlining blends and digraphs, identifying CVCC patterns, copying words or sentences from the chalk board.
- These types of activities do not elicit the joy of personal construction that Piaget so aptly described. They are not engaging. They reinforce dependency on the teacher, rather than independent learning.

With ENCODING INSTRUCTION (speech-to-print):

- Pronunciation and meaning are immediately activated because the word to be built must be pronounced either silently or aloud (typically left hemisphere processing).

- Segmentation of phonemes is primarily accomplished by the motor (articulatory) system with its superior capability for sequencing and memory.

- Retrieval of knowledge about the alphabet code involves (*articulated*) *sound-to-letter* associations.

- This process involves *construction* of personally meaningful words.

- Activities involve meaningful interaction with text—primarily assembling letter tiles, or using a keyboard, magic slate, or pencil to write dictated words, sentences or stories. Encodable CVC words are taught in a systematic way, so that children can gradually build up a repertoire of the 40 letters/ digraphs that represent the basic 40 phonemes in English. In a very short time, students can learn and practice 40 (articulated) sound-letter associations using them to build whole encodable words. The neural networks for these 40 paired associations will be laid down consistently, (closely connected to speech and comprehension) without the confusion of dealing with more complex spelling patterns or "outlaw" words. Very soon, students can add spelling rules and outlaw words to their repertoires with mini-lessons, as they write notes to mom, identify and caption pictures, create lists of favorite foods, colors, etc., and read them to each other or to their families, exchange their stories with each other, etc. *Writing is not a separate language arts subject; it is a very efficient route to early reading.*

- These activities are engaging, because they are empowering. Mastery of the code enables a child to write any word. Even if a word is not spelled perfectly, someone else can usually read it. This successful communication makes it clear to a child how words get on paper and what reading and writing are all about.

If encoding instruction results in phoneme awareness and phonics skills; if it is more likely to activate "speech memory" and left hemisphere processing; if it is more efficient; and if it is more fun, then why are so few minutes of each language arts hour spent encoding? Here are a few ideas to consider for possible changes in phonics instruction:

1-The names of letters are not particularly useful. The only characteristic of a letter that is relevant to reading or writing is its sound. (The most frequent spelling error in first grade is the confusion of the name of the letter with its sound, such as RM for ARM, BT for BEAT, NHR for NATURE, etc.) Letter names are used by teachers in the classroom many times more frequently than letter sounds. It would be less confusing to children to refer to letters more frequently by their sounds than by their names.

2-There is no need at all to count phonemes if children are assembling letter tiles, writing on a magic slate, or using a computer to make words. They simply need to associate a letter (or letters) with each sound their mouth makes as they pronounce the word. The number of phonemes is irrelevant. The important thing is to find the letter(s) to represent each phoneme uttered.

3-Teach children that when they say a word their mouth makes sounds strung together like beads on a string. The more they pay attention to what their mouth is doing when they make a speech sound, the more likely they are to remember the association of sound-to-letter. It

is the motor production of speaking the sound that the brain uses to sequence, store, and remember.

4- Systematic encoding instruction: Start by teaching ONE way to represent each of the basic 40 sounds. There are thousands of encodable words that children can sound-out and spell on their own, even big words, like FAN- TAS-TIC . (“Encodable” words are the same as “decodable” words, that is they are regularly spelled using the alphabet code.)

5-Some curricula include the following instructions for the teacher: “Write the sentences below on the chalkboard. Have students copy the sentences and fill in the blanks with one of the words from the list.”

Students should rarely be asked to copy words or sentences. They can accomplish this task mindlessly in a way that very little is learned. They may remember the visual appearance of some of the words, but that is not a long-term (“speech memory”) way to remember them. There is little incentive to memorize the spellings of the words, and they are not using the code at all. They will only have practiced penmanship, and copying skills. Consider the time-efficiency of this lesson: First the teacher has to write 8 sentences on the board. Then the students have to copy them all. All they are doing is creating their own worksheet. The words for the blanks are supplied by a list, so all words are spelled out for them. If instead, the phrases or sentences were dictated, the student would activate verbal memory, pronounce the words silently, apply the alphabet code, produce the words without having to look back and forth at the board, and also accomplish the penmanship practice.

6-Some curricula have something like this in the lesson plan: “Write the list on the chalkboard. Ask a volunteer to identify a consonant-blend in each word.”

Nineteen children wait, while Johnny tries to visually analyze a word (like BLEND) and figure out the consonant blend. Of what use is naming and identifying BL as a “consonant blend?” Instead of using a visual pattern recognition strategy, the student could encode the word BLEND. If he fails to hear (feel) the fact that his mouth has made two sounds, the teacher could say, “Think about what your mouth did. Say it again and feel what your mouth does after you say “b”. The concept of blending is learned physically and stored away in the brain with information about pronunciation. There is no need to underline blends. To construct a word with a blend, Johnny will need two letters if his mouth is making two sounds. When he reads back what he wrote he will blend the sounds.

7- There is no need to underline digraphs. Most digraphs are introduced systematically, as part of the set of letters that represent the 40 speech sounds. (For example, children learn to use CH to stand for the sound /ch/ in words like CHIP, or BRANCH. As they write CH words and read them back, they learn to recognize CH as the sound /ch/. Underlining digraphs does not activate the critical link between the letters and the articulated sound.)

8 -When children ask how to spell a word, the reply should invariably be “Sound it out!” If they need help to correct their attempt, a few words from the teacher can help them hear/feel a missing sound, or remind them of a rule (for example, “It takes an E on the end to make that vowel say its name.”)

From the many studies of phonics instruction, it seems clear that systematic phonics instruction is more effective than embedded phonics instruction (Ehri, 2003). However in most studies it was primarily systematic *decoding* instruction that was examined, because only a small amount of *encoding* instruction was included. Even if a curriculum is shown to be effective, the data do not reveal which parts of the curriculum are the *most* effective or the most efficient. One example of research examining encoding instruction was carried out by Joseph Torgesen, Ph.D. at Florida State University, who did a study with children identified at the beginning of first grade as the 20% most at-risk for reading failure. The children were taught in small groups, combining teacher-led and computer-assisted instruction, using two methods that used primarily encoding instruction. One method focused students' attention on what their lips and mouth were doing when speech sounds were produced. The other systematically introduced the 40 phonemes and taught children to use the computer keyboard to type dictated words and sentences. The children in both groups showed significant gains in phonemic reading skills (two full standard deviations) and their gains for fluency were almost as strong as those for accuracy. Reading comprehension scores were higher than expected based on the children's estimated general verbal ability.

It is hoped that this article will serve to stimulate discussion among researchers, educators, and publishers about these ideas, and that further research will examine the efficiency and the "engagement factor", as well as the efficacy of incorporating more encoding into early reading instruction in the classroom. Educators have advocated a writing-to-read approach in the past, including Maria Montessori and Romalda Spalding, and John Henry Martin. Many teachers instinctively use these ideas in the classroom, even though they are not commonly taught in schools of education.

Remnants of the "reading wars" still rumble below the surface. Teachers who honor joyful learning, construction, and discovery in the classroom are naturally put off by drill-and-practice worksheets for counting phonemes or digraphs. But throwing out phonics is not the solution. There is an easier solution-- *phonics instruction can be changed!*

Human learning, like breathing, is a matter of taking in and putting out. Good teaching engages the expressive as well as the receptive mind. Dealing successfully with written language -- the task of literacy -- requires automatic skill with the alphabetic code. Writing (the expressive) and reading (the receptive) both start with learning the code. Practice with encoding enhances facility with decoding; they are simply two halves of the same breath.

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REFERENCES

Adams, M. J. (1994) *Beginning to Read*, MIT Press, Cambridge, MA

Aylward, E.H., Richards, T.L., Berninger, VW, Nagy, WE, Field, KM, Grimme, AC, Richards, AL, Thomson, JB, Cramer, SC (2003) Instructional treatment associated with

changes in brain activation in children with dyslexia. *Neurology*.2003; 61: 212-219

Castiglione-Spalten, M.L. & Ehri, L. Phonemic Awareness Instruction: Contribution of Articulatory Segmentation to Novice Beginners' Reading and Spelling, *Scientific Studies of Reading*, 7 (1) 25-52.

Ehri, L., (1994) Development of the ability to read words: Update. In R. Ruddell, M. Ruddell, & H. Singer (eds), *Theoretical models and processes of reading* (4th ed pp 323-358). Newark, DE: International Reading Association

Ehri, L. (2002) Phases of Acquisition in Learning to Read Words and Implications for Teaching, *Learning and Teaching Reading*, pp 7-28 British Psychological Society

Ehri, L. (2004) Teaching Phonemic Awareness and Phonics, in McCardle, P. & Chhabra V. (eds) *The Voice of Evidence in Reading Research* pp153-18 Paul Brookes, Baltimore, MD.

Moats, L., (1998) Teaching Decoding, *American Educator*, Spring/Summer, pp 42-49, 95-96.

Shaywitz, S. (2003), *Overcoming Dyslexia: A new and complete science-based program for reading problems at any level*. New York; Alfred A. Knopf.

Shaywitz, B. Shaywitz, S. Blachman, B., Pugh, K., Fulbright, R., Skudlarski, P. (2003), Development of left occipito-temporal systems for skilled reading following phonologically-based intervention in children. Paper presented at the meeting of the Organization for Human Brain Mapping, New York.

Simos, P.G., Fletcher, J.M., Bergman, E. , Breier, J.I., Foorman, B.R., Castillo, E.M., Davis, R.N., Fitzgerald, M. & Papanicolaou, A.C. Dyslexia-specific brain activation profile becomes normal following successful remedial training. *Neurology* 2002;58:1203-1213

Torgesen, J.K., Wagner, R.K. Rashotte, C.A. Herron, J., Lindamood, P. A comparison of two computer-assisted approaches to the prevention of reading disabilities, Unpublished manuscript, Florida State University, Tallahassee, Fl. Reviewed and posted by Florida Center for Reading Research, 2005.